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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,440	11/03/2005	Yoshio Mitani	1272-0121PUS1	4240

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EXAMINER

LIAO, DIANA J

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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07/14/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/555,440	Applicant(s) MITANI ET AL.	
	Examiner DIANA J. LIAO	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-7 is/are pending in the application.
- 4a) Of the above claim(s) 4-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/2/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

1. Claims 1 and 2 are presented for examination. Claim 3 has been cancelled and 4-7 have been withdrawn. Claim 1 has been amended by applicant.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konya, et al. (US 2003/0103890) in view of Menashi, et al. (US 5,063,179) and Murota, et al. (US 6,677,095).

Konya '890 teaches a hydrophobic silica fine powder prepared with a hydrophobizing agent in the form of a dimer diol siloxane and/or cyclic siloxane. The aerated bulk density is 100-300g/L and the degree of hydrophobization is 40-80 as

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measured through methanol titration. The primary particle size is 10-120nm. (claim 1)

The degree of hydrophobization as measured in Konya '890 is equivalent to the M-value as recited by the instant claims. The silica powder taught in Konya '890 is disclosed to be suitable as a dispersant in organic solvent to form a wax, paint, ink or filler. (para 1)

Example 3 in Konya, et al. also teaches a dispersion test using

decamethylcyclopentasiloxane in which the silica is suspended for at least a week with no settling, indicating good dispersion. (para. 23)

Konya '890 teaches a fumed silica treated with a cyclic siloxane, with an overlapping M-value. Konya '890 also teaches its product to have good dispersion, and to have a use as a dispersant. Although Konya '890 does not teach the use of cyclic dimethylsiloxane, it is found to be fairly suggested by the teachings of Konya '890 to use cyclic siloxanes in general as a hydrophobizing agent. The M-values taught in Konya '890, desirably 45-77 (para. 19) and that of the claimed range, 48-65 are overlapping ranges and thus there is a *prima facie* case of obviousness. Konya '890 demonstrates through the different examples that the whole range of degrees of hydrophobization are attainable, including those which fall directly in the claimed range. Therefore, the use of dimethylsiloxane and the claimed M-value range are not found patentable over the prior art.

Regarding impurities, though Konya, et al. does not teach a silica product mostly void of nitrogen and metal oxide impurities, it would be obvious to one of ordinary skill in the art to achieve such a product. Since there is no mention of a significant contribution in the product from impurities, one can assume that the product is fairly pure. Creating

silica through pyrolysis is also known to be a path which yields very high purity silica. In addition, there are known methods for purifying silica powders. Menashi, et al. (US 5063179), for example, teaches a silica with few impurities, and outlines a procedure for getting rid of metal impurities. (col 5, lines 22-47) The fumed silica products disclosed in Menashi, et al. shows good purity. (see Tables II and III) Since well known methods of purification exist for silica, a silica of few impurities is not found patentable over the prior art. One of ordinary skill in the art would be aware of means for purifying their silica product if it became apparent that there were impurities hindering its utility.

Konya '890 is silent regarding an n-value and the size of aggregate particles. Konya '890 also teaches an aerated bulk density, and not a tapped density.

Murota '095 teaches a metal oxide fine powder, including silica, having high dispersibility with a hydrophobic-treated surface with a hydrophobicity of over 30% and a particle size distribution wherein more than 55% of agglomerated particles is in the range of 0.1 to 10 μm . (claim 6) The powder can be used in a toner composite for photographs and the like. (col 1, lines 8-12) It is preferable for the powder to have a bulk density of more than 30g/L so that there is no problem with dust when handling. As the bulk density increases, the dispersion improves as does the ability to control particle size. (col 4, lines 37-45)

Regarding bulk density, neither Konya '890 nor Murota '095 directly teach a tapped bulk density value. However, both teach the desirability of a higher density, as both references teach the processing of silica in order to raise this density. In the case of the aerated bulk density of Konya '890, the starting material and the end product

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often differ by a factor of 3 or 4 in its density. Thus it would appear that bulk density in general, is a fairly controllable property. Murota '095 teaches bulk density and there is no way of ascertaining if the bulk density values are tapped bulk density, aerated, or value determined under other parameters. In the case that Murota '095 teaches tapped density, it would teach an overlapping range of at least 30 g/L. One would be motivated to attain a bulk density of at least 30 g/L in order achieve ease of handling. Murota '095 does not specifically disclose in any examples a product with a bulk density over 130 g/L (Table 1, example 3) suggesting a general order of magnitude desired. The claimed range of bulk density appears to be a matter of optimization.

Regarding particle size, Murota '095 teaches that more than 55% of the agglomerated particles are from 0.1 to 10 μm , which is within the claimed range. Although Murota '095 does not specifically teach that less than 200ppm by weight of particles larger than 45 μm , Murota '095 does teach that particle size distribution is important in dispersibility and that the desired mean size is far below 45 μm . Therefore, Murota '095 fairly suggests the production of a powder where very little of the composition is above 45 μm , causing the claimed limitation to not be found patentable over the prior art.

One would be motivated to combine the values taught in Murota '095 into the product of Konya '890 since Konya '890 teaches the use of its powder in wax or in ink compositions. Murota '095 teaches its product for use in a toner composite, which is both an ink and a polymer or wax composite. The bulk density of the products in Konya '890 start at much lower than their final, and if such a high bulk density is not necessary,

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as taught in Murota '095, then it would be obvious to one of ordinary skill in the art to modify the process of Konya '890 to create a product with a density closer to Murota '095. One would also combine desired agglomerated size taught in Murota '095 with the product in Konya '890 in order to achieve a better dispersion as taught in Murota '095.

Regarding n-value, since other properties of the silica do not appear to overcome the prior art, the n-value is considered to be inherent or obvious. Both Konya '890 and Murota '095 teach good dispersibility and high dispersion to be highly desirable and attained. Konya '890 teaches highly stable dispersions of its silica including a solution in a siloxane showing no settling after a week. The property of a certain dispersibility in toluene, which may be interpreted as a property given an intended use, is not found patentable over the prior art.

Therefore, due to overlapping ranges, generic teaching of cyclic siloxane, bulk density, particle size, and the dispersibility characteristics of the silica powders taught in the prior art, claims 1 and 2 are not found patentable over the prior art.

Response to Arguments

5. Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that the bulk density taught in Konya '890 is aerated bulk density and not claimed tapping bulk density and thus the ranges are not overlapping since aerated density is usually lower than tapped bulk density and thus the ranges

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would no longer overlap. However, the aerated bulk density of the starting material in Konya '890 is below that of the claimed range, as low as 45 g/L in the examples. (para. 21-26) It would be reasonable to believe that this original aerated bulk density would have fallen into that of the instant claims since double 45 g/L is 90 g/L. Therefore during the process of increasing the density, a product of the claimed tapped bulk density must have been made. Therefore, the examiner believes that there is reasonable evidence that the claimed properties were achieved as an intermediate product in the process taught in Konya '890.

In addition, the aerated bulk density range as taught by Konya '890 is 100-300 g/L, which may still overlap a tapped bulk density range of 80-130 g/L. Even though the aerated bulk density must be lower than the tapped bulk density, there is no clear conversion factor, and thus it is still possible to be below 130 g/L, leaving the reference still valid for optimization to the instant claims.

Applicant also argues that the n-value of the product in the prior art does not fall in the claimed range because of the use of a ball mill. However, comparative examples 4 and 5 in the specification describe a process in which a silica is hydrophobitized and then later processed in a ball mill to increase density. Konya '890 teaches a process in which the silica is hydrophobitized and milled to break the binding structure between silica particles simultaneously (para. 13), and not in discrete steps as is presented in the specification. Therefore, no direct conclusion can be made regarding the n-value of the silica. In addition, since these are product claims, and not process claims, this argument is not found persuasive. The examiner has interpreted claimed n-values to

correspond to a good dispersion ability which is taught to be present in the prior art. Since the products appear to be substantially similar, all arguments pertaining to the process are not found applicable.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Deller, et al. (US 5,776,240).

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Claims 1 and 2 have been rejected. No claims have been allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIANA J. LIAO whose telephone number is (571)270-3592. The examiner can normally be reached on Monday - Friday 8:00am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/
Primary Examiner, Art Unit 1793

DJL